



# KEUFFEL & ESSER CO.

*Adams and Third Streets Hoboken, N.J.*

TELEPHONE OLDFIELD 9-1100 · TELETYPE HOB 10

DRAFTING · REPRODUCTION · SURVEYING · OPTICAL METROLOGY · AUDIOVISUAL · PHOTOGRAHMETRY

March 8, 1965

Mr. T. Nelson  
Sys. Consultant  
Box 1546  
Poughkeepsie, New York 12603

\*Please see attached  
cc: New York Dept.

Dear Mr. Nelson:

Photography is still "king".

Of all the reproduction systems none offers the versatility and quality of the photographic process. And of all the industrial photographic materials available no manufacturer offers a more complete selection than the K&E PHOTACT (R) Line.

Your copy of our new "Selection Guide" to the PHOTACT Line illustrates the many cost-saving applications and short cuts to be gained with PHOTACT. Not only is the PHOTACT Line the most complete but also the most unique -- with individual characteristics that draftsmen need and appreciate.

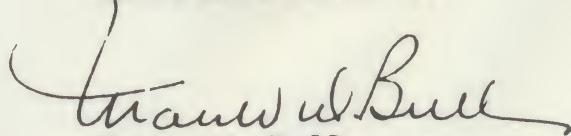
PHOTACT forms a natural bridge between the drafting room and the reproduction department. We think you'll find this brochure valuable in illustrating how the photographic process can increase the efficiency and scope of your operation.

Should you have some specific questions that the brochure does not answer or would like a demonstration of any of the PHOTACT materials or techniques please contact your K&E dealer\*. You'll find his experience and cooperation invaluable.

Thanks for your interest.

Very truly yours,

KEUFFEL & ESSER CO.

  
Marsh W. Bull  
General Sales Manager

*Main Office: HOBOKEN, N. J.*

*Branches: NEW YORK · PHILADELPHIA · BALTIMORE · ORLANDO · DETROIT · CLEVELAND · AKRON · CHICAGO · MILWAUKEE · ST. LOUIS  
KANSAS CITY · WICHITA · DALLAS · HOUSTON · DENVER · LOS ANGELES · SAN FRANCISCO · SEATTLE · ANCHORAGE · TORONTO · MONTREAL*

MWB:j1  
#96

## **KEUFFEL & ESSER CO.**

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60 EAST 42nd STREET, N. Y. 17, N. Y.

MURRAY HILL 7-6510

25-34 JACKSON AVENUE, L. I. C. 1, N. Y.

EMPIRE 1-2190

## **RUEHLE-SHAW COMPANY, INC.**

44 CLINTON STREET

MARKET 3-3358

NEWARK, N. J.

MARKET 3-1607

## **ACADEMY BLUEPRINT CORP.**

48 STATE STREET

DIAMOND 3-3811

HACKENSACK, N. J.



**Photact<sup>®</sup>**  
KEUFFEL & ESSER COMPANY

NEW YORK • HOBOKEN, N. J. • PHILADELPHIA • DETROIT • CHICAGO • MILWAUKEE • ST. LOUIS • DALLAS • DENVER • SAN FRANCISCO • LOS ANGELES • SEATTLE • ANCHORAGE • TORONTO • MONTREAL

*SELECTION GUIDE  
to the complete line  
of photographic materials  
for industrial  
reproduction*

# Introduction

- PHOTACT materials by Keuffel & Esser Co. have unique properties not to be found in any other line of photographic materials.

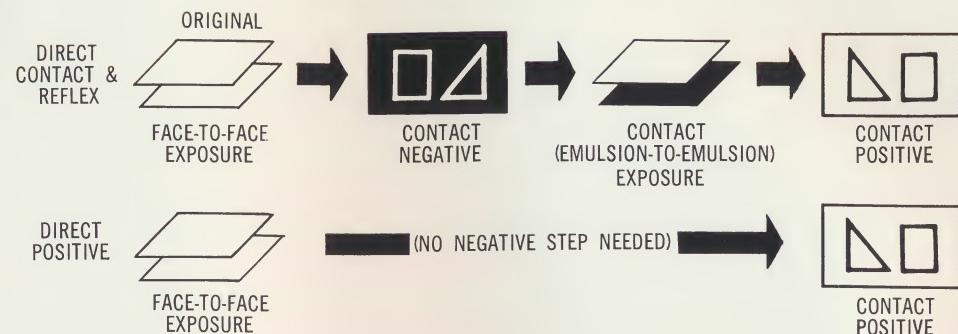
Chief distinction of the PHOTACT line is its exceptionally fine combination of drafting and photographic properties. Today when drawings must undergo countless revisions, duplicates of a master drawing must be just as "draftable" as the original, and in most cases must take over and serve as *the* original.

Only PHOTACT provides this vital link between drafting room and reproduction department. In the process, many dynamic shortcuts in the production and distribution of engineering drawings and related material are made possible. It is no accident that these K & E products serve both the draftsman and reproduction man equally well. For 95 years—K & E has been in constant contact with both professions, learning their problems and developing products to solve them.

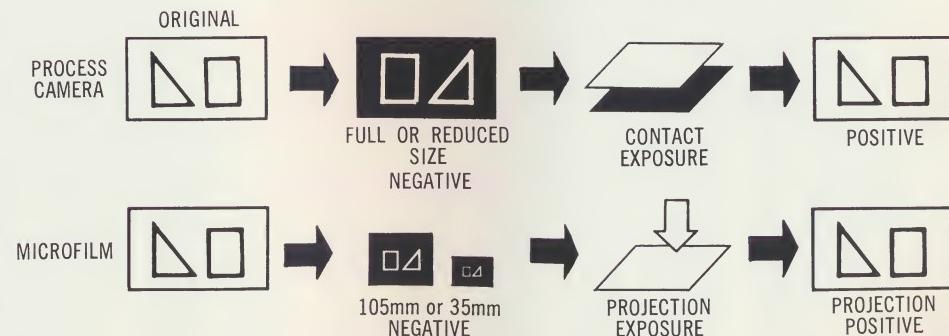
The job of engineering reproduction today is one of immense diversity, calling for a vast number of tailor-made reproduction products. These complex needs are reflected in the PHOTACT line, with more items from which to choose than offered by any other manufacturer. To help you match the correct material to the specific task you have in mind, we have developed this Selection Guide. We hope it proves useful.

All PHOTACT materials—paper, cloth and film—have silver salt, photographic emulsions. They fall into two main categories—those used for contact reproductions, and those used in projection work, for enlargements from microfilm or other negatives. To the right are diagrams explaining the various processes. The end product of all the processes is a positive-image copy of an original tracing or document. In the contact methods, the copy is the same size as the original, and, when made on translucent material, is known as a *duplicate original* (sometimes also called an *intermediate* or *second original*). The function of the photographic duplicate original is exactly the same as that of the original drawing from which it is made. End product of the projection method can be a same-size duplicate original, or a smaller version, usually half-size, to cut reproduction material costs.

## CONTACT METHODS



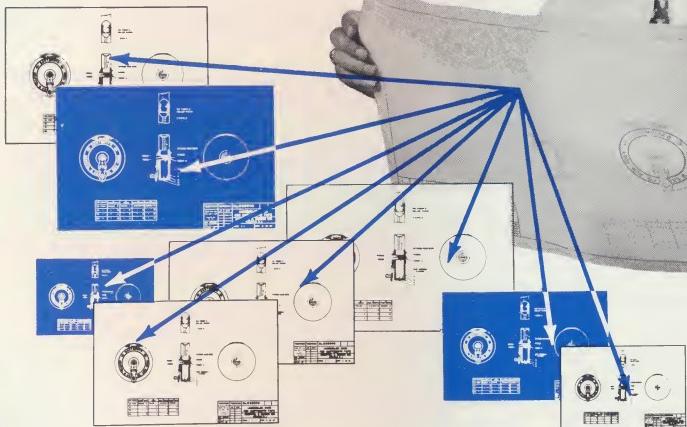
## PROJECTION METHODS



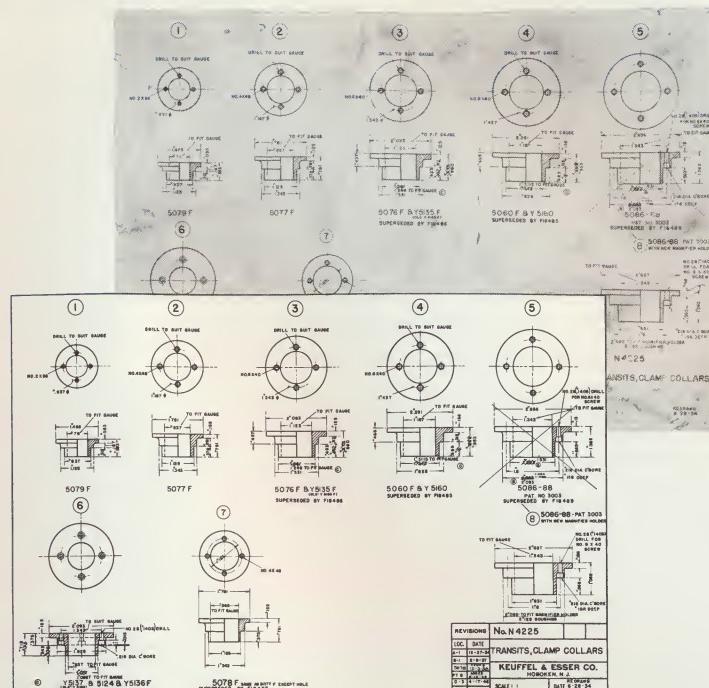
*The products and the processes are explained further on subsequent pages.*

# Photact® CAN HELP YOU IN MANY WAYS...

## MULTIPLE "ORIGINALS"



Often branches, sub-contractors or decentralized plants will require the same master tracing at the same time. The problem is readily solved using PHOTACT materials. Exact, same-size copies—perfect replicas of the original in every way—can be made on PHOTACT paper, cloth or film. One PHOTACT negative will produce all the ink-like “duplicate originals” needed. They can then be used at outlying points to process all necessary additional prints by low-cost means such as diazo or blueprint.



## RESTORE OLD, HARD-TO-PRINT DRAWINGS

When tracings, because of age, soiling or heavy usage, become too opaque to yield a readable print, another original obviously must be made. One method is to re-draw by hand—a costly and time-consuming process. Another way, using PHOTACT paper or film, gets the same results at far less expense. First a contact negative is made, using a PHOTACT material that registers high-contrast black and white. Much of the background discoloration drops out immediately. Further retouching—spotting, opaquing, etching—can be done on the negative. A positive is then made resulting in a sharp duplicate original, which can be substituted for the old tracing.



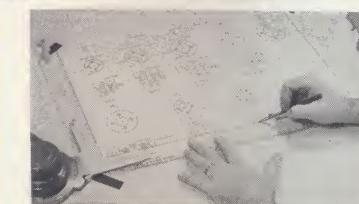
## SCISSORS DRAFTING

When elements of one drawing are to be combined with those of another, a lot of valuable board time can be eliminated by substituting scissors for pencil. Here's how the technique works...

1. Make PHOTACT contact negatives of the different drawings to be combined. Also make a negative of your company title block.
2. Cut out the various elements from each drawing which will comprise the new one. Use of a light table is recommended.
3. Strip in the individual elements on the title-block negative, securing them with transparent pressure-sensitive tape. At this point, you can opaque and correct.
4. Make a PHOTACT positive from your composite negative. Add the necessary lettering and descriptions, and you have a completely new original drawing.

## FLIP-SHEETS, CHARTS & TRAINING AIDS

Large charts or sheets, such as those used in flip-chart presentations, can often be reproduced least expensively in small quantities (under 50) using PHOTACT duplicate originals and diazo prints. As the quantities increase, beyond 50, factors such as time and handling will tend to make silk-screen or offset printing more desirable.

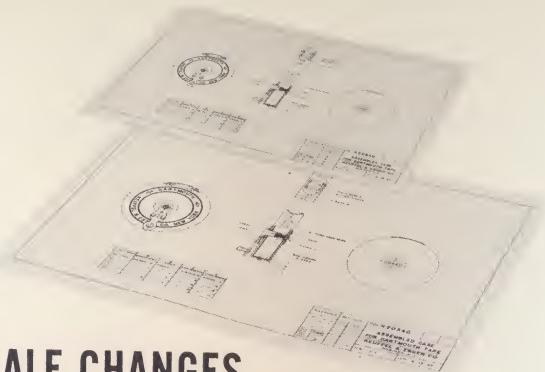


## EXTENSIVE REVISIONS

Should an existing drawing need to undergo major revisions much laborious work can be saved using PHOTACT materials. First, a PHOTACT negative is made and all unwanted elements of the drawing are opaqued out.

Then a PHOTACT positive is produced—on paper, cloth or film—and sent to the drafting room where new elements can be drawn in.

The result, a combination of photography and drafting, is nevertheless an "original" in every sense, one from which prints or additional photographic duplicates can be made.



## SCALE CHANGES

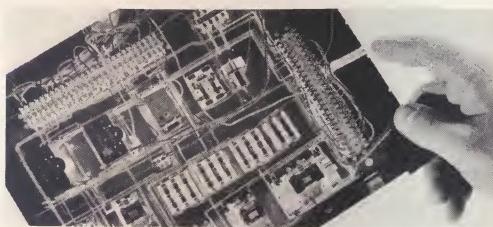
To effect scale changes, drawings are first photographed on 105mm or 35mm microfilm, or by process cameras. The most prevalent scale change today is known as the "half-size" reduction in which working prints of drawings are reduced to half the linear scale of the original. Savings in reproduction costs by using half-size prints are often remarkable (one-half scale means one-fourth the area). PHOTACT materials are ideal for microfilm projection. They yield sharp, high-quality half-size masters, from which additional prints can be made. Drawings to different scales can also be brought to a common scale using the same photographic techniques and PHOTACT projection materials.

## PRESERVE VALUABLE ORIGINALS

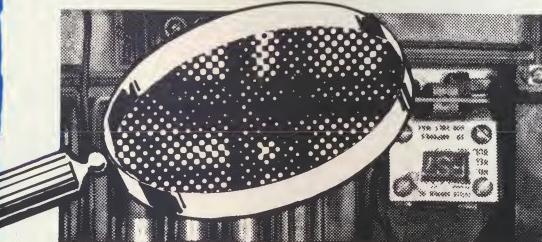
With complex engineering drawings often representing thousands of dollars in man hours, it pays to protect the original from excessive handling and possible damage. A PHOTACT duplicate original, with all the sharpness and ink-like quality of a hand-drawn tracing, does the job cheaply and dependably. Use a PHOTACT translucent paper if reproduction needs are moderate, a polyester-base film for heavy duty. The original stays filed away, safe and sound.

## PHOTODRAFTING

Why make a standard engineering drawing when a photograph will do the job as well? No reason at all, and this is why the new technique of photodrafting is growing in acceptance. With a few details sketched or lettered in by the draftsman, a photo can be a complete, functional guide to assembly or construction. Here is how it's done.



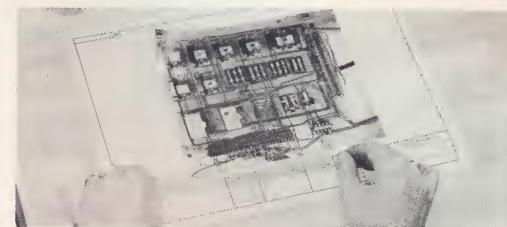
1. Take a good, clear photograph of the prototype, machine or model, front and side views if needed.



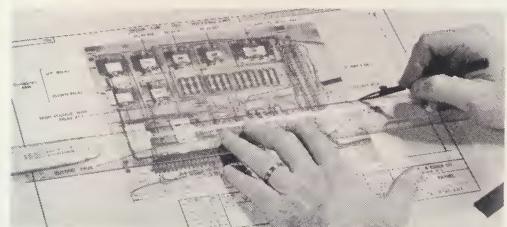
2. Make a half-tone projection print. This is done by introducing a half-tone screen under vacuum at the projection plane of the enlarger. The screen breaks the photo-image into dots, which will give a continuous tone effect, even on materials such as diazo which have limited tone capacities. PHOTACT Polyester Projection film is an ideal medium for the half-tone positive.



3. Duplicate your company title block on a base similar in transparency to the material used for the half-tone projection print. PHOTACT Contact Polyester film is an excellent matching choice.



4. Strip in half-tone print on title-block print, by cutting away the necessary area in title sheet, fixing half-tone in place with Dulseal Transparent Tape which has a built-in drafting surface.



5. Have draftsman put in the necessary call-outs and identification marks. When complete, this represents a new original drawing. Further touch-up can be done by making a PHOTACT paper negative, opaquing the thin lines where title-block and half-tone were stripped together.

*the right photographic method  
+ the right Photact material  
= the best result*

Two questions must be answered to determine the correct matching of photographic method and PHOTACT material for best results:

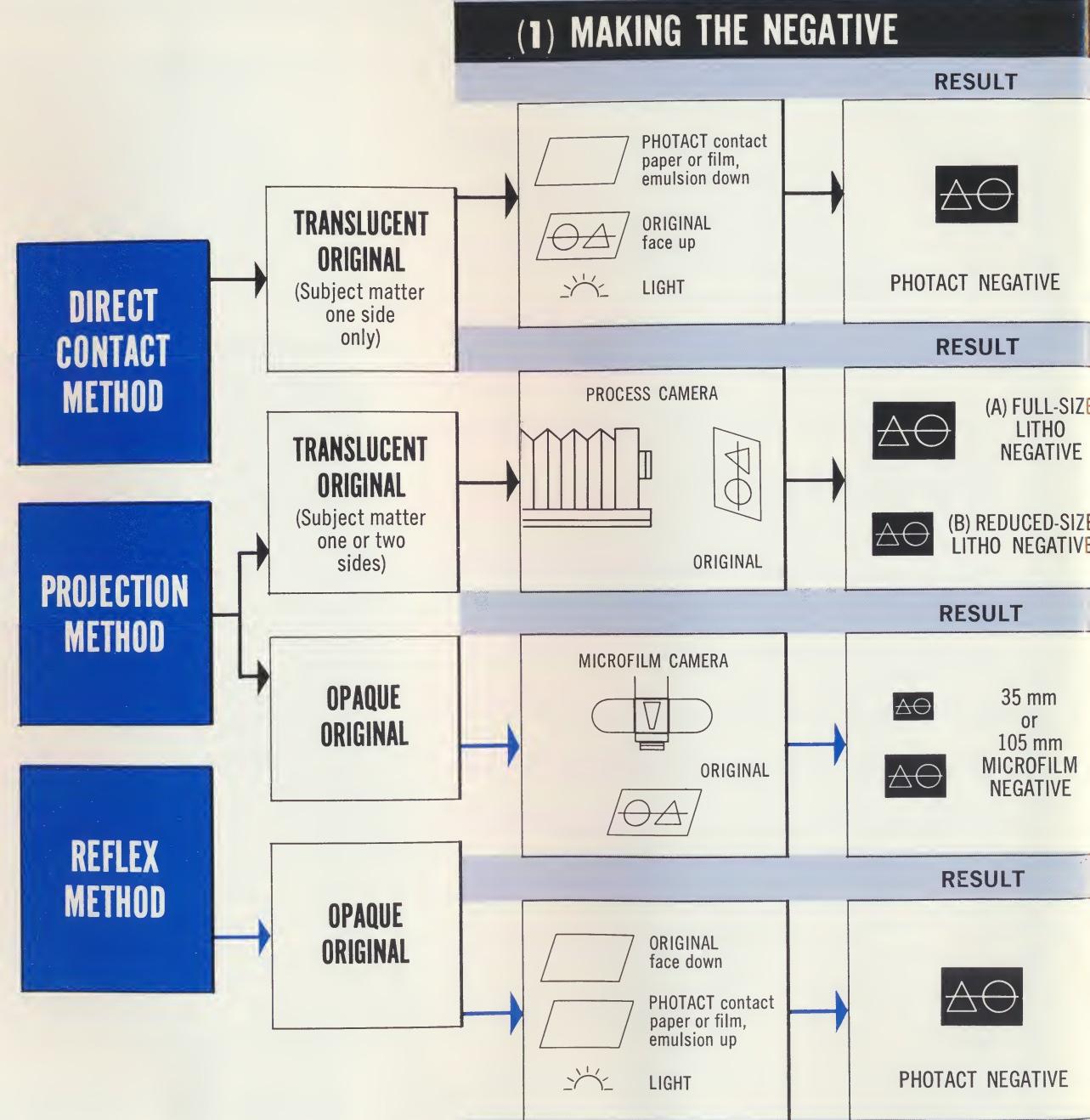
1. What is the nature of the original to be reproduced?
2. What use will the reproduction receive?

Answer these, and it is easy to proceed. The nature of the original—translucent or opaque, one-or-two sided—determines the method. End use will dictate whether or not prints should be made on translucent or opaque material. The quantity of additional prints needed will influence whether to make a final translucent duplicate original on paper, cloth or film. Paper is least expensive, but will not withstand heavy usage. Polyester Film takes the heaviest wear, and cloth lies in-between.

The flow-chart at right outlines the three main methods of working with PHOTACT materials. Listed under "Products to Use" are the K & E catalog numbers of the various papers, cloths and films recommended to do the job. There are often reasons for preferring one over the other, so we have symbol-coded the numbers and on the following pages give complete descriptions of all the materials. The symbol codes are...

PAPER — ●  
CLOTH — ○  
POLYESTER FILM — ○  
TRI-ACETATE FILM — ●

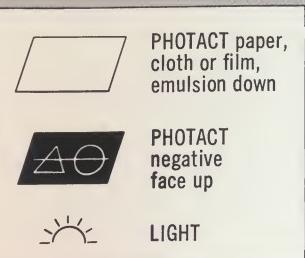
By narrowing down your choice of materials on this chart, the descriptions on the following pages will give you the exact material for your purpose.



## (2) MAKING PRINTS FROM THE NEGATIVE

### PRODUCTS TO USE

PAPER: 400 ●  
401 ●  
408TG ●  
FILM: 414 ○



### RESULT

PHOTACT positive print, translucent or opaque

### PRODUCTS TO USE

**TRANSLUCENT:**  
PAPER: 401ET ●  
405 ●  
407 ●  
CLOTH: 410 ○  
410W ○  
FILM: PB409 ○  
414 ○

### PRODUCTS TO USE

LITHO NEGATIVE  
PAPER OR FILM  
(Not in K & E line)



### RESULT

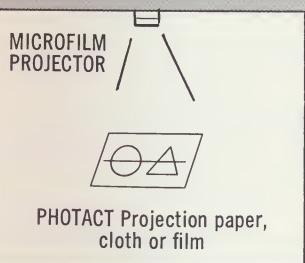
FULL-SIZE PHOTACT positive print, translucent or opaque  
REDUCED-SIZE PHOTACT positive print, translucent or opaque

### PRODUCTS TO USE

**OPAQUE**  
PAPER: 400 ●  
401 ●  
401CS ●  
CLOTH: 412 ○  
FILM: 414-3 ○

### PRODUCTS TO USE

K & E MICROFILM  
35 mm: 634-2; 634-3  
105 mm: 634; 634-1



### RESULT

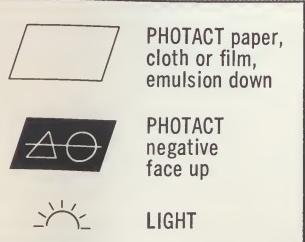
FULL-SIZE PHOTACT positive print, translucent or opaque  
REDUCED-SIZE PHOTACT positive print, translucent or opaque

### PRODUCTS TO USE

**TRANSLUCENT:**  
PAPER: 404ET ●  
415 ●  
CLOTH: 420W ○  
420 ○  
FILM: PB419 ○

### PRODUCTS TO USE

PAPER: 400 ●  
401 ●  
408TG ●  
FILM: 414-3 ○



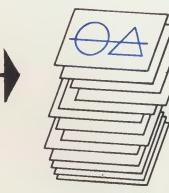
### RESULT

PHOTACT positive print, translucent or opaque

### PRODUCTS TO USE

**OPAQUE:**  
PAPER: 404 ●  
404T ●

## (3) MAKING ADDITIONAL PRINTS



# Photact<sup>®</sup>

## MATERIALS

**PAPERS**—Two varieties of paper—natural and transparentized—are coated with PHOTACT photographic emulsions. The heaviest weight natural papers are designed to produce opaque prints, and are not intended for diazo or blueprint reproduction. Those in the medium weight range (85gm and 105gm) are used primarily as negative papers. The lightest natural papers (55gm) serve primarily as low-cost duplicate originals, when reproduction and handling will be relatively low. Transparentized papers are used solely to make duplicate originals for use as intermediates in diazo and blueprint processing. Waterproof transparentized papers have the best scale-holding properties of all the papers.

**CLOTHS**—PHOTACT cloths fall midway between paper and polyester films in scale holding properties and durability. Their primary use is for duplicate originals, especially when additional drafting will be required. The drafting surface of cloth has excellent pencil and ink take. Often cloth is selected be-

cause the greater part of the existing drawings on file have been made on cloth, and it is convenient to reproduce all originals and duplicates at the same speeds.

**FILMS**—There are two types of films in the PHOTACT line—those on a polyester film base and those on cellulose tri-acetate, commonly called just tri-acetate. PHOTACT polyester films are the most durable and dimensionally stable of all the materials in the line. They are practically indestructible, making them ideal for long reprint runs, frequent handling and extensive usage. PHOTACT polyester films are the only photographic films available with a two-layer drafting surface—in the photo emulsion and beneath the emulsion—which permits repeated redraws and erasures. For this reason they are rapidly becoming the standard films used today. Tri-acetate, in its clear form, makes excellent negatives, with better scale holding properties than paper.

### ● CONTACT PAPERS

CATALOG NO.	BASE	SURFACE CHARACTERISTICS	EMULSION TYPE	APPLICATION	DARK ROOM ILLUMINATION	SURFACE ERASURES		PHOTOGRAPHIC IMAGE REMOVAL	
						PENCIL	INK	CHEMICAL	MECHANICAL
400	105 gm. natural paper	Drafting surface, emulsion side	High contrast, short latitude	Primarily for negatives, direct contact or reflex, especially from very soiled originals. Also for semi-opaque positive reference prints.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
400T	85 gm. natural paper	Drafting surface, emulsion side	High contrast, short latitude	Primarily for negatives, direct contact or reflex, especially from very soiled originals. Also for semi- opaque positive reference prints.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
400ET	55 gm. natural paper	Drafting surface, emulsion side	High contrast, short latitude	For low-cost duplicate originals where additional print needs will be light.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
400TG	85 gm. natural paper	Glossy surface for high visual contrast, no drafting properties	High contrast, short latitude	For direct contact or reflex negatives from very soiled originals.	OA Filter	None	None	K&E Eradicator (3028)	None
401	105 gm. natural paper	Drafting surface, emulsion side	Medium contrast, wide latitude	Primarily for negatives, direct con- tact or reflex, when originals con- tain both pencil & ink lines. Also for semi-opaque positive reference prints.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
401T	85 gm. natural paper	Drafting surface, emulsion side	Medium contrast, wide latitude	Primarily for negatives, direct con- tact or reflex, when originals con- tain both pencil & ink lines. Also for semi-opaque positive reference prints.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
401ET	55 gm. natural paper	Drafting surface, emulsion side	Medium contrast, wide latitude	For low-cost duplicate originals where additional print needs will be limited.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
401-2	135 gm. natural paper	Emulsion with drafting surface, both sides	Medium contrast, wide latitude	For positive prints with images on both sides to reduce bulk.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
401CS	240 gm. natural paper	Drafting surface, emulsion side	Medium contrast, wide latitude	For heavy weight positive prints, especially posters, plant layout work, etc.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
405	17 lb., 100% rag transparent- ized paper	Drafting surface, emulsion side	Medium contrast	For duplicate originals with high transparency, good strength, where reproduction needs will be fairly heavy.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Pink Pearl (3453) Eraser
407	14 lb., 100% rag transparent- ized paper	Drafting surface, both emulsion side and reverse	Medium contrast	For duplicate originals with high transparency, good strength, where reproduction needs will be fairly heavy.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
408TG	80 gm. natural paper	Glossy surface for high visual contrast, no drafting properties	Very high contrast, medium latitude	For direct contact or reflex nega- tives, especially from very soiled originals with both pencil and ink lines.	OA Filter	None	None	K&E Eradicator (3028)	None

## ● PROJECTION PAPERS

CATALOG NO.	BASE	SURFACE CHARACTERISTICS	EMULSION TYPE	APPLICATION	DARK ROOM ILLUMINATION	SURFACE ERASURES		PHOTOGRAPHIC IMAGE REMOVAL	
						PENCIL	INK	CHEMICAL	MECHANICAL
404	105 gm. natural paper	Drafting surface, emulsion side	Micro-project- tion, medium latitude	For semi-opaque positive reference prints, by projection from microfilm negatives.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
404T	85 gm. natural paper	Drafting surface, emulsion side	Micro-project- tion, medium latitude	For semi-opaque positive reference prints, by projection from microfilm negatives.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
404ET	55 gm. natural paper	Drafting surface, emulsion side	Micro-project- tion, medium latitude	For low-cost duplicate originals where additional print needs will be limited.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None
415	17 lb., 100% rag trans- parentized paper	Drafting surface, emulsion side	Micro-project- tion, medium latitude	For duplicate originals with high transparency, good strength, where reproduction needs will be fairly heavy.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Pink Pearl (3453) or Van Dyke (3457) Erasers

## ○ CONTACT CLOTHS

410	.0045" to .0050" water- proofed blue tracing cloth	Drafting surface, emulsion side	Medium contrast	For duplicate originals of high transparency, excellent strength.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser
410W	.0045" to .0050" water- proofed white tracing cloth	Drafting surface, emulsion side	Medium contrast	For duplicate originals of high transparency, excellent strength.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser
412	.0075" white opaque trac- ing cloth	Drafting surface, emulsion side	Medium contrast	For exceptionally strong positive prints of maps, charts, etc., and for plant layout work.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser

## ○ PROJECTION CLOTHS

420	.0045" to .0050" water- proofed blue tracing cloth	Drafting surface, emulsion side	Micro-project- tion, medium latitude	For duplicate originals of high transparency and excellent strength from microfilm negatives.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser
420W	.0045" to .0050" water- proofed white tracing cloth	Drafting surface, emulsion side	Micro-project- tion, medium latitude	For duplicate originals of high transparency and excellent strength from microfilm negatives.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser

## ○ CONTACT POLYESTER FILMS

PB409	.003" polyester film base (.0045" with emulsion)	Drafting surface, emulsion side and reverse	Medium contrast	For duplicate originals of high transparency, exceptional strength.	OA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser
PB411	.003" polyester film base (.0045" with emulsion)	Drafting surface, emulsion side and reverse	Medium contrast	For direct positive duplicate originals (no negative required) of high transparency, exceptional strength.	OA Filter or subdued light	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser

## ○ PROJECTION POLYESTER FILM

PB419	.003" polyester film base (.0045" with emulsion)	Drafting surface, emulsion side and reverse	Micro-project- tion, medium latitude	For duplicate originals of high transparency and exceptional strength from microfilm negatives.	IA Filter	Pink Pearl (3453) or TAD (3448) Erasers	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	Moist Van Dyke (3457) Eraser
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## ● TRI-ACETATE FILMS

414	.005" tri-acetate film	Clear, no drafting surface either side	Medium contrast	For direct contact negatives where good strength and scale-holding properties are required. Also for extremely transparent positives.	OA Filter	None	None	K&E Eradicator (3028)	None
414-3	.0075" white opaque tri- acetate film	Drafting surface, emulsion side and reverse	Medium contrast	For charts, maps and plant layout work where high visual contrast is required.	OA Filter	Pink Pearl (3453) or TAD (3448) Eraser	Moist Van Dyke (3457) Eraser	K&E Eradicator (3028)	None

# Photact® PROCESSING

Complete instructions on PHOTACT processing are packed in each roll or carton. Here are a few of the suggestions which will lead to excellent results.

**Darkroom Illumination**—PHOTACT materials have different degrees of light sensitivity. Projection materials should be handled under red light (1A red filter in safelight) to insure against accidental fogging. Contact materials are less sensitive and may be handled under subdued light or with an OA yellow filter in the safelight.

**Exposure**—PHOTACT materials should be exposed with incandescent or fluorescent lights. When making contact negatives, exposure with a yellow light helps to build up contrast. Yellow light should also be used for reflex printing, while white light is recommended for making contact positives. Exposure time will vary according to the intensity of the light in the particular type of exposing equipment used. A series of test-strip exposures using the various PHOTACT materials is recommended to establish exact timing.

**Developing**—Place the exposed PHOTACT paper, cloth or film in the developer tray containing a solution of K & E 425 PHOTACT developer. Be sure to immerse the sheet in the developer as evenly and as quickly as possible. Take care that development is continuous over the entire surface of the PHOTACT sheet. It is advisable to agitate the sheet in the developer to insure complete and constant development. Normal development, for the best density and contrast, takes about 45 seconds, and exposure time should be controlled accordingly.

**Short-Stop**—To arrest development and neutralize the effect of the developer, place the print into the acid short-stop bath for 30 seconds.

**Fixer**—Immerse the print in a solution of K & E 427 fixer, leaving it there for 5 to 10 minutes. Proper fixing is important to prevent stains when the prints age. On waterproof PHOTACT materials, the fixing process takes somewhat less time.

**Water-Wash**—The print should be washed *thoroughly*, preferably in running water to remove all chemicals and avoid stains and fading of the image. Washing time varies with the base materials. Paper takes longest, waterproof cloth less and polyester film least.

## ACCESSORY MATERIALS



### Developer

N425G PHOTACT Developer for making one gallon of developer solution.  
N425V PHOTACT Developer for making five gallons of developer solution.

### Fixer

N427G PHOTACT Fixer for making one gallon of fixing solution.  
N427V PHOTACT Fixer for making five gallons of fixing solution.

### Transparentizing Fluid

TRANSLUX® 3042E. If the image lines of a negative are partially filled in or "greyed over," an application of this solution to these localized areas will increase light passage.

### Opaquing Solution

NO-RINKLE® BLACK 3021. Useful for touching up areas on the negative to prevent light passage in areas of lighter density.

### Eradicating Fluid

3028. Two fluids in 1 oz. bottles. For eradicating the silver image of PHOTACT prints. The No. 1 solution reacts with the metallic silver image to produce a white salt of silver. The No. 2 solution dissolves this salt leaving a clear area.

Enough of the No. 2 solution should be used to neutralize the No. 1 solution, thus avoiding the possibility of yellow stains. The eradicated area should be swabbed with cotton and water, blotted and dried. This removes chemical residues which might interfere with reprint transparency.

### Transparent Mending Tape

Dulseal 76A (rolls 375 ft. long by  $\frac{3}{4}$ " wide) and Dulseal 76B (rolls 125 ft. long by  $\frac{3}{4}$ " wide). Dulseal is tissue thin (.0015") transparent film with an inert, permanent setting adhesive on one side and a matte surface on the other. Applied to paper, cloth or film, it forms a permanent transparent covering or edging which can be drawn on with pencil or ink. It is permanent, chemically stable, waterproof and washable. It stands up under repeated erasures.

# TIPS TO IMPROVE YOUR Photact TECHNIQUE

PROBLEM	CAUSE	PREVENTION	PROBLEM	CAUSE	PREVENTION
Fine, parallel black or grey streaks on prints.	Abrasion; material scratched or scuffed prior to processing.	Pull material up and away from surface when removing from roll. Ease sheets off top rather than from middle of package. Keep surfaces free of dirt and dust and covered with a soft material such as a vinyl.	White finger prints on negatives.	Grease or hypo on fingers prior to processing.	Keep hands dry and clean; use print tongs.
Blistering (separation or frilling of emulsion from base in small bubbles or spots).	Processing solutions too warm, or too great a difference between solution temperatures. Too much flexing in handling. Also excessive washing or exhausted fixing bath.	Check temperatures and keep all solutions at manufacturer's recommended level. Mix fixer completely in correct sequence and change frequently. Do not bend or flex materials in handling.	Dark finger prints on positives.	Developer on fingers before exposure or processing. Handling washed or dry prints with hypo on fingers.	Keep hands clean and dry.
Black spots on prints.	Undissolved chemicals or chemical dust. Air bells on prints in fixing solution.	Keep shelves and open areas free of dry chemical dust. Be sure developer is completely mixed. Agitate prints thoroughly in fixing bath.	Overall fog.	Light leaks in darkroom, or incorrect safe lights. Also overdevelopment or use of improperly mixed developer (too little bromide). Use of outdated or improperly stored material.	Follow instructions regarding safelights, exposure and development. Rotate stock to use oldest materials first. Store in cool dry place in light-tight wrapping.
Blurred or unsharp images.	<b>Projection:</b> Projector lens dirty, scratched or out of focus. Vibration during exposure.	Readjust focus, if not automatic. Clean lens. Check for vibration.	Mottle (many small areas of uneven blackness in prints).	Insufficient agitation in developer. Use of outdated or improperly stored material.	Store material in cool, dry place. Rotate stock. Agitate frequently in developer.
Cracks in emulsion.	<b>Contact:</b> Incomplete contact between materials during exposure. Material bent or creased in handling. Too much hardener in fixing solution.	Make sure vacuum is working when contact is made, check vacuum gauge. Store materials flat. Follow directions carefully when mixing fixer.	Shrinking or stretching.	During processing, photographic materials (especially papers) absorb water, causing change in dimension.	Choose waterproof paper or cloth to keep absorption at minimum. Use polyester film base for best results. Let prints air dry.
Too much or too little contrast.	Incorrect exposure or development. Use of outdated or fogged material.	Follow manufacturer's instructions carefully as to exposure and development. Run test strips to check printing times. Use fresh materials, and keep in light-free, dry storage area.	Areas of different density.	Uneven development. Stacking of prints in developer.	Agitate and separate prints in developer.
Curl.	Storage in too warm or too dry area prior to processing. In prints: too rapid drying or use of excessive heat.	Store unexposed material in cool, dry place. Lower temperature on dryer, or regulate speed. Use print flattening solution—after washing—of 1 oz. glycerine to 1 quart of water. Immerse for 1-2 minutes.	Brown stains.	Exhausted or incorrect developer. Or not long enough in wash bath.	Replace developer before it becomes exhausted. Use recommended developer. Wash as recommended by manufacturer.
Overall yellow stains.	Improper fixing, or incomplete washing.	Keep in fixing bath for prescribed length of time. Replace fixer frequently. Keep in wash for full time recommended.	Purple (metallic) sheen or stain.	Continued action of developer during fixation.	Be sure that print is completely immersed in a fixing bath of proper strength. Agitate print when first placed in fixer.
			Yellow stains.	Exhausted developer. Prolonged development, or developer too warm. Failure to use stop bath. Exhausted fixer. Insufficient washing.	Use fresh developer and fixer. Do not use developer or fixer beyond exhaustion. Follow recommended processing procedures and times. Agitate prints in all baths and do not allow them to stick together. Keep processing solutions at recommended temperatures.
			White spots.	Dust or dirt. Air bells on surface during development.	Keep dark room and printing equipment clean. Submerge print completely and agitate frequently.



## is at your service

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You may have found among the applications suggested in this booklet some that fit your needs exactly. On the other hand, you may have specialized problems not covered here, for which the PHOTACT process would be the ideal solution.

K & E Branches and Dealers are at your service, not only to make PHOTACT intermediates and prints for you, but to offer suggestions and any advice you may require.

For example, if you're planning to install your own reproduction department, K & E can save you hours of planning by providing a complete suggested layout.

Through many years of service and experience, K & E has accumulated a great storehouse of technical knowledge. It is at your disposal. The answer to one of your knottiest technical problems may be just a telephone call away.

**K E U F F E L & E S S E R C O M P A N Y**